(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) Publication number: **0 638 560 A1**

(12) **EUROPEAN PATENT APPLICATION published in accordance with Art. 158(3) EPC**

(21) Application number: **93906348.3**

(22) Date of filing: **12.10.92**

(86) International application number: **PCT/JP92/01325**

(87) International publication number: **WO 93/07129 (15.04.93 93/10)**

(51) Int. Cl.[6]: **C07D 243/22**, C07D 243/24, C07D 495/04, C07D 495/14, A61K 31/55

(30) Priority: **11.10.91 JP 327954/91**

(43) Date of publication of application: **15.02.95 Bulletin 95/07**

(84) Designated Contracting States: **AT BE CH DE DK ES FR GB GR IE IT LI LU MC NL SE**

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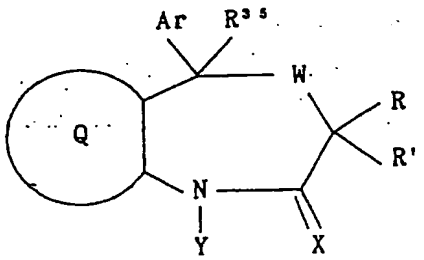
Claims

1. A therapeutic agent for osteoporosis comprising, as an active ingredient, an azepine compound or a pharmaceutically acceptable salt thereof of the formula



(I)

wherein

Ar is aryl or heteroaryl;

X is an oxygen atom or a sulfur atom;

Y is hydrogen, alkyl, alkenyl, alkynyl, $-(CH_2)aCOOR^1$ wherein R^1 is hydrogen, alkyl, aryl or aralkyl and a is an integer of 1 to 6, $-(CH_2)a$-cycloalkyl wherein a is an integer of 1 to 6, $-(CH_2)aN(R^2)(R^3)$ wherein a is an integer of 1 to 6 and R^2 and R^3 are the same or different and each is hydrogen, alkyl or aralkyl, or form, together with the adjacent nitrogen atom, a heterocycle, $-(CH_2)bCON(R^{41})(R^{42})$ wherein b is 0 or an integer of 1 to 6, and R^{41} and R^{42} are the same or different and each is hydrogen, alkyl, aryl or aralkyl, or form, together with the adjacent nitrogen atom, a heterocycle, $-(CH_2)aCN$ wherein a is an integer of 1 to 6, or $-(CH_2)aCR^4{}_3$ wherein a is an integer of 1 to 6 and R^4 is halogen, or

X and Y combinedly form $=N-N=C(R^6)-$, $=N-C(R^5)=C(R^6)-$, $=C(R^5)-N=C(R^6)-$, $=N-O-CO-$ or $=N-N(R^5)-CO-$ wherein R^5 and R^6 are each hydrogen, halogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkylalkyl, aryl, heteroaryl, aralkyl, heteroarylalkyl, aryloxyalkyl, $-(CH_2)aCOOR^7$ wherein a is an integer of 1 to 6 and R^7 is hydrogen, alkyl, alkenyl or aralkyl, or $-(CH_2)aNHCOR^{43}$ wherein a is an integer of 1 to 6 and R^{43} is alkyl or aralkyl;

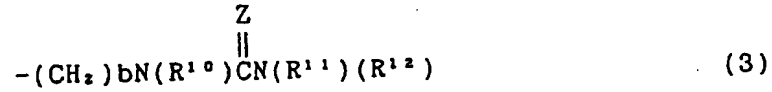
W is $-N(R^{35})-$ wherein R^{35} is hydrogen or forms a bond with R^{35}, -O- or -S-;

R^{35} is hydrogen or forms a bond with R^{36};

R is hydrogen, alkyl, haloalkyl, aryl, heteroaryl, aralkyl, heteroarylalkyl or a group of the formula selected from the group consisting of:

$-(CH_2)bN(R^8)(R^9)$ (1)

$-(CH_2)bOR^{10}$ (2)

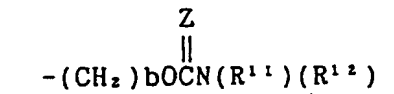


(3)

$-(CH_2)bN(R^{10})CORa^{11}$ (4)

$-(CH_2)bN(R^{10})SO_2R^{44}$ (5)

$-(CH_2)bN(R^{10})COOR^{45}$ (6)



(7)

$-(CH_2)bOCOR^{46}$ (8)

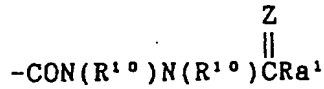
$-(CH_2)bCON(R^{47})(R^{48})$ (9)

$-(CH_2)bOSO_2R^{44}$ (10)

$-(CH_2)bCOR^{49}$ (11)

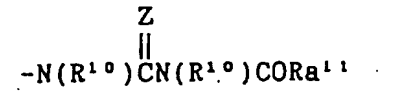
$-(CH_2)bS(O)nR^{11}$ (12)

$-CON(R^{10})OR^{8}$ (13)



(14)

$-CON(R^{10})N(R^{10})SO_2Ra^{11}$ (15)



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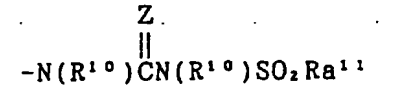


(17)

$-CON(R^{10})N(R^{10})(R^{11})$ (18)

$-(CH_2)bN(R^{10})COCON(R^{11})(R^{12})$ (19)

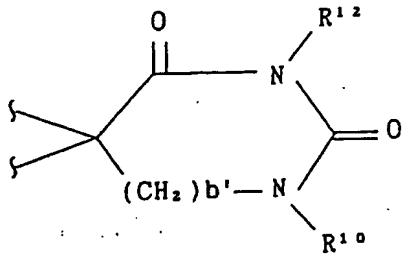
and

$-(CH_2)aCOOR^{1}$ (20)

wherein b is 0 or an integer of 1 to 6, Z is an oxygen atom or sulfur atom, R^8 and R^9 are the same or different and each is hydrogen, alkyl, aryl or aralkyl, R^{10} is hydrogen, alkyl or aralkyl, R^{11} and R^{12} are the same or different and each is hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, heteroaryl or heteroarylalkyl, Ra^{11} is alkyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, heteroaryl or heteroarylalkyl, R^{44} is alkyl, aryl, aralkyl, cycloalkyl or heteroaryl, R^{45} is alkyl, aryl or aralkyl, R^{46} is alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, heteroaryl or heteroarylalkyl, R^{47} and R^{48} are the same or different and each is hydrogen, alkyl, acyl, aryl or aralkyl, R^{49} is alkyl, aryl, aralkyl, heteroaryl or heteroarylalkyl, n is 0, 1 or 2, a is an integer of 1 to 6 and R^1 is hydrogen, alkyl, aryl or aralkyl;

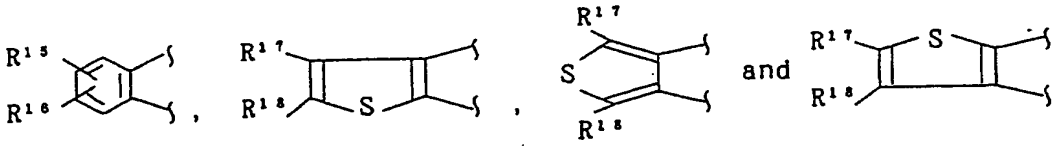
R' is hydrogen or $-COOR^8$ wherein R^8 is hydrogen, alkyl, aryl or aralkyl, or

R and R' combinedly form a spiro ring of the formula



wherein b' is 0 or 1, R^{10} is hydrogen, alkyl or aralkyl and R^{12} is hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, heteroaryl or heteroarylalkyl;

ring Q is a ring selected from the group consisting of:



wherein R^{15} and R^{16} are the same or different and each is hydrogen, halogen, alkyl optionally substituted by halogen, alkoxy, nitro, amino, amino substituted by alkyl, cyclic amino, hydroxy, acyloxy, cyano, carbamoyl, carbamoyl substituted by alkyl, cyclic aminocarbonyl, carboxyl, alkoxycarbonyl or aralkyloxycarbonyl, aralkyl, aralkyl substituted by alkyl, alkoxy, nitro, amino, amino substituted by alkyl, cyclic amino, hydroxy, acyloxy, cyano, carbamoyl, carbamoyl substituted by alkyl, cyclic aminocarbonyl, carboxyl, alkoxycarbonyl or aralkyloxycarbonyl,

R^{17} and R^{18} are the same or different and each is hydrogen, halogen, alkyl, alkenyl, alkynyl, haloalkyl, alkoxy, nitro, amino, amino substituted by alkyl, cyclic amino, hydroxy, acyloxy, cyano, carbamoyl, carbamoyl substituted by alkyl, cyclic aminocarbonyl, carboxyl, alkoxycarbonyl, aralkyloxycarbonyl, cycloalkyl, alkylcarbonyl, a group of the formula

R^{19}-A-

wherein A is alkylene, alkenylene or alkynylene which may be substituted by 1 to 3 hydroxys and R^{19} is alkoxy, nitro, amino, hydroxy, acyloxy, cyano, carboxyl, alkoxycarbonyl, aralkyloxycarbonyl, phenyl optionally substituted by 1 to 3 substituents (e.g. halogen, hydroxy, alkyl, alkoxy, aryl, aryloxy, aralkyl, aralkyloxy, alkenyl or alkynyl having 2 to 18 carbon atoms, which may be substituted by 1 to 3 hydroxys, aralkenyl or aralkynyl having alkenyl moiety or alkynyl moiety having 2 to 18 carbon atoms, which may be substituted by 1 to 3 hydroxys), a group of the formula

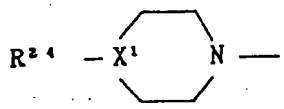
$(R^{20})(R^{21})NCO$- or $(R^{20})(R^{21})N$-SO_2-

wherein R^{20} and R^{21} are the same or different and each is hydrogen, aryl, aralkyl or straight- or branched chain alkyl, alkenyl or alkynyl which may be substituted by halogen, hydroxy, nitro, amino or substituted amino, or R^{20} and R^{21} may, together with the adjacent nitrogen atom, form a 3 to 7-membered ring which may be substituted by straight- or branched chain alkyl and may have, in the ring, nitrogen, oxygen or sulfur atom as a hetero atom (the additional nitrogen atom may be substituted by straight- or branched chain alkyl having 1 to 4 carbon atoms, aralkyl or diarylalkyl), a group of the formula

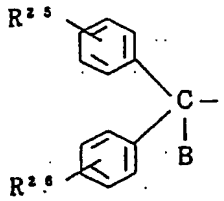
$(R^{22})(R^{23})N$-

wherein R^{22} and R^{23} are the same or different and each is hydrogen, straight- or branched chain alkyl, alkenyl or alkynyl, which may be substituted by halogen, hydroxy, amino, alkylamino, dialkylamino, cyclic amino or C-bonded heterocyclic group (carbons may be interrupted by nitrogen, oxygen or sulfur

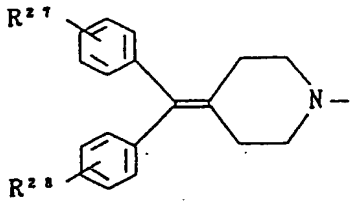
atom), straight- or branched chain alkylcarbonyl which may be mono- or di-substituted by hydroxy, halogen, amino, alkylamino, dialkylamino, cyclic amino or straight- or branched chain alkyl (this alkyl may be substituted by halogen or hydroxy), arylcarbonyl, arylsulfonyl, alkylsulfonyl, or R^{22} and R^{23} may form, together with the adjacent nitrogen atom, a saturated or unsaturated 3 to 7-membered ring which may be substituted by straight- or branched chain alkyl and may have, in the ring, nitrogen, oxygen or sulfur atom as a hetero atom (each additional nitrogen atom may be substituted by straight- or branched chain alkyl), a group of the formula



wherein R^{24} is aryl, aralkyl, arylcarbonyl, a group of the formula



wherein R^{25} and R^{26} area thee same or different and each is hydrogen, halogen, haloalkyl, amino, nitro, cyano, hydroxy, alkyl or alkoxy and B is hydrogen, hydroxy or esterified hydroxy, or alkyl having hydroxy and/or carbonyl and X^1 is CH or nitrogen atom, or a group of the formula



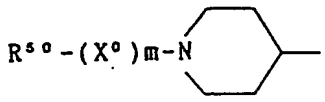
wherein R^{27} and R^{28} are the same or different and each is hydrogen, halogen, haloalkyl, amino, nitro, cyano, hydroxy, alkyl or alkoxy,
a group of the formula

R^{29}-(CH_2)d-C≡C-

wherein R^{29} is aryl or optionally hydrogenated heteroaryl and d is 0, 1 or 2, a group of the formula

R^{29}-O-(CH_2)e-C≡C-

wherein R^{29} is as defined above and e is 1 or 2, or a group of the formula



wherein X^0 is -OCO-, -CO- or -N(R^{51})CO- where R^{51} is hydrogen or alkyl, m is 0 or 1, R^{50} is alkyl, alkynyl, 2-phenylethynyl, 2-thienylsulfonyl, -(CH_2)aCN where a is an integer of 1 to 6, -(CH_2)b-R^{52} where b is 0 or an integer of 1 to 6 and R^{52} is cycloalkyl, morphlino, thienyl, alkoxy, aryl, imidazolyl or tetrahydropyranyl or -SO_2N(R^{53})(R^{54}) where R^{53} and R^{54} are the same or different and each is hydrogen, alkyl, or R^{53} and R^{54}, with the adjacent nitrogen atom, form a heterocycle, or

adjacent R^{17} and R^{18} may combinedly form a saturated or unsaturated 5, 6 or 7-membered ring which is condensed to thiophene ring, said ring being optionally substituted by a substituent Ra^{30} selected from hydrogen, halogen, alkyl, a group of the formula R^{19}-A- wherein each symbol is as defined above and a group of the formula (R^{20})(R^{21})NCO- or (R^{20})(R^{21})N-SO_2- wherein each symbol is as defined above, or R^{17} and R^{18} may combinedly form a 5, 6 or 7-membered hetero ring which may have oxygen, sulfur or -N(Rb^{30})- as a hetero atom;

examples of Rb^{30} include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, alkoxycarbonyl, alkanoyl, aroyl, cycloalkylcarbonyl, cycloalkoxycarbonyl, cycloalkylalkylcarbonyl, cycloalkylalkoxycarbonyl, cycloalkylaminocarbonyl, a group of the formula R^{19}-A- wherein each symbol is as defined above, a group of the formula (R^{20})(R^{21})NCO- wherein each symbol is as defined above, a group of the formula (R^{20})(R^{21})N-SO_2- wherein each symbol is as defined above, a group of the formula Ra^{31}-SO_2- wherein Ra^{31} is alkyl, phenyl, phenyl substituted by halogen, alkyl, alkoxy, carboxy, alkylsulfonyl, alkylthio haloalkyl or optionally substituted phenoxy, heteroaryl or naphthyl, a group of the formula

$$Rb^{31}-NH-C-$$
$$\|$$
$$Y^1$$

wherein Y^1 is oxygen atom or sulfur atom and Rb^{31} is alkenyl, alkyl, cycloalkyl, aryl, aralkyl, heteroaryl, heteroarylalkyl, phenyl substituted by 1 to 3 substituents selected from alkyl, alkoxy, aryloxy, alkylsulfonyl, halogen and haloalkyl, quinolyl or sulfonyl substituted by phenyl, heteroaryl or naphthyl, or a group of the formula

$$Rc^{31}-S-CH_2-C-$$
$$\|$$
$$Y^1$$

wherein Y^1 is oxygen atom or sulfur atom and Rc^{31} is alkyl, phenyl substituted by phenyl, halogen, alkyl, alkoxy, haloalkyl or optionally substituted phenoxy, or heteroaryl;

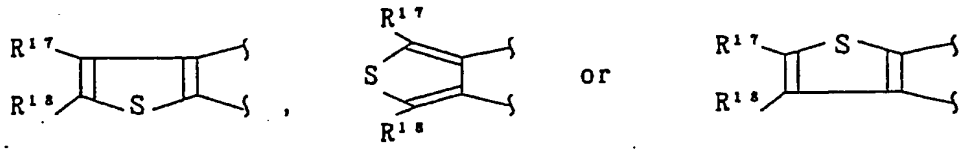
in the above definitions, aryl, aryloxy, aryloxyalkyl, arylcarbonyl, arylsulfonyl, aralkyl, aralkyloxy, aralkyloxycarbonyl, aralkenyl, aralkynyl, diarylalkyl, heteroaryl and heteroarylalkyl may have, on the ring, 1 to 3 substituents selected from halogen, alkyl, alkoxy, haloalkyl, hydroxy, nitro, amino, cyano and acyloxy; cycloalkyl of cycloalkyl, cycloalkylalkyl, cycloalkylcarbonyl, cycloalkylalkylcarbonyl, cycloalkoxycarbonyl, cycloalkylalkoxycarbonyl and cycloalkylaminocarbonyl may have 1 to 3 substituents selected from halogen, alkyl, alkoxy, haloalkoxy and aryl.

2. The therapeutic agent for osteoporosis according to Claim 1, comprising, as an active ingredient, a compound of the formula (I) wherein W is -N(R^{35})- where R^{35} forms a bond with R^{35}, or a pharmaceutically acceptable salt thereof.

3. The therapeutic agent for osteoporosis according to Claim 1, comprising, as an active ingredient, a compound of the formula (I) wherein W is -N(R^{35})- where R^{35} forms a bond with R^{35} and X and Y combinedly form =N-N=C(R^6)- where R^6 is as defined above, or a pharmaceutically acceptable salt thereof.

4. The therapeutic agent for osteoporosis according to Claim 1, comprising, as an active ingredient, a compound of the formula (I) wherein W is -N(R^{35})- where R^{35} forms a bond with R^{35} and X and Y combinedly form =N-N=C($R^{6'}$)- where $R^{6'}$ is alkyl having 6 to 20 carbon atoms, or a pharmaceutically acceptable salt thereof.

5. The therapeutic agent for osteoporosis according to Claim 1 or Claim 3, comprising, as an active ingredient, a compound of the formula (I) wherein the ring Q is

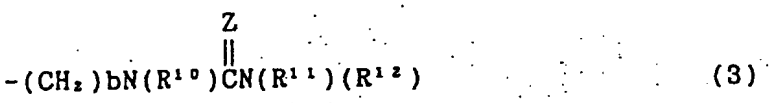


wherein R^{17} and R^{18} are as defined in Claim 1, or a pharmaceutically acceptable salt thereof.

6. The therapeutic agent for osteoporosis according to Claim 5, comprising, as an active ingredient, a compound of the formula (I) wherein W is -N(R^{35})- where R^{35} forms a bond with R^{35}, R is alkyl, aryl, heteroaryl, aralkyl, heteroarylalkyl or a group of the formula selected from the group consisting of:

-$(CH_2)_b$N(R^8)(R^9) (1)

-$(CH_2)_b$OR^{10} (2)

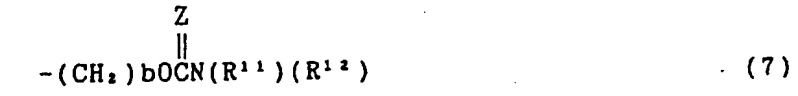


(3)

-$(CH_2)_b$N(R^{10})CORa^{11} (4)

-$(CH_2)_b$N(R^{10})SO_2R^{44} (5)

-$(CH_2)_b$N(R^{10})COOR^{45} (6)



(7)

-$(CH_2)_b$OCOR^{46} (8)

-$(CH_2)_b$CON(R^{47})(R^{48}) (9)

-$(CH_2)_b$OSO_2R^{44} (10)

-$(CH_2)_b$COR^{49} (11)

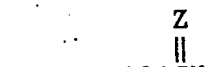
-$(CH_2)_b$S(O)nR^{11} (12)

-CON(R^{10})OR^8 (13)

(14)

-CON(R^{10})N(R^{10})SO_2Ra^{11} (15)

(16)



(17)

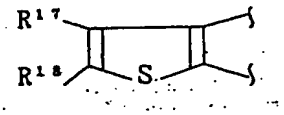
-CON(R^{10})N(R^{10})(R^{11}) (18)

-(CH$_2$)bN(R^{10})COCON(R^{11})(R^{12}) (19)

and

-(CH$_2$)aCOOR^1 (20)

wherein each symbol is as defined in Claim 1 and the ring Q is a group of the formula



wherein each symbol is as defined in Claim 1, or a pharmaceutically acceptable salt thereof.

7. The therapeutic agent for osteoporosis according to Claim 5, comprising, as an active ingredient, a compound of the formula (I) wherein W is -N(R^{36})- wherein R^{36} forms a bond with R^{35}, R is alkyl, aryl, aralkyl or a group of the formula selected from the group consisting of:

-(CH$_2$)bN(R^8)(R^9) (1)

(3)

-(CH$_2$)bN(R^{10})CORa^{11} (4)

-(CH$_2$)bN(R^{10})SO$_2$R^{44} (5)

-(CH$_2$)bN(R^{10})COOR^{45} (6)

(7)

-(CH$_2$)bCON(R^{47})(R^{48}) (9)

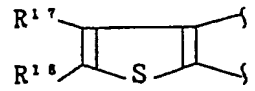
-(CH$_2$)bOSO$_2$R^{44} (10)

-(CH$_2$)bCOR^{49} (11)

and

$-(CH_2)aCOOR^1$ (20)

wherein each symbol is as defined in Claim 1 and the ring Q is a group of the formula



wherein each symbol is as defined in Claim 1, or a pharmaceutically acceptable salt thereof.

8. The therapeutic agent for osteoporosis according to Claim 1, comprising, as an active ingredient, a compound of the formula (I) which is selected from the group consisting of:

9-tert-butyl-4-(2-chlorophenyl)-2-(2-(4-isobutylphenyl)ethyl)-6-methyl-6H-thieno[3,2-f][1,2,4]triazolo-[4,3-a][1,4]diazepine,

3-[4-(2-chlorophenyl)-6,9-dimethyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-2-yl]propionic morpholide,

4-(2-chlorophenyl)-6,9-dimethyl-2-(3-morpholinopropyl)-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepine,

4-(2-chlorophenyl)-2-(2-(4-isobutylphenyl)ethyl)-9-methyl-6-propyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepine,

4-(2-chlorophenyl)-6-isobutyl-2-(2-(4-isobutylphenyl)ethyl)-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo-[4,3-a][1,4]diazepine,

4-(2-chlorophenyl)-2-(2-(4-isobutylphenyl)ethyl)-9-methyl-6-phenyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepine,

6-benzyl-4-(2-chlorophenyl)-2-(2-(4-isobutylphenyl)ethyl)-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepine,

N-(4-(2-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f]{1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-2-indolecarboxamide,

N-(4-(2-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-3-indoleacetamide,

6-benzoylamino-4-(2-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepine,

4-(2-chlorophenyl)-2-ethyl-9-methyl-6-(3-(3-tolyl)ureido)-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepine,

8S-(+)-6-(2-chlorophenyl)-3-cyclopropanecarbonyl-8,11-dimethyl-2,3,4,5-tetrahydro-8H-pyrido-[4',3':4,5]thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepine,

6-(2-chlorophenyl)-8,9-dihydro-1,4-dimethyl-8-morpholinocarbonyl-4H,7H-cyclopenta[4,5]thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepine,

(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)acetic acid,

N-(2-methoxyphenyl)-(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepin-6-yl)acetamide,

N-phenyl-(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)acetamide,

N-(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-p-toluenesulfonamide,

(4-(4-methoxyphenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N-(3-methylphenyl)carbamate,

4-(2-chlorophenyl)-2-ethyl-9-methyl-6-phenylacetylamino-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepine,

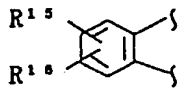
N-(4-chlorophenyl)-N'-(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepin-6-yl)urea,

N-(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-methoxyphenyl)urea,

N-(4-(4-chlorophenyl)-2-hexyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-

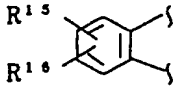
methylphenyl)urea,
N-(4-(2-chlorophenyl)-2,3,9-trimethyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-methylphenyl)urea,
N-(4-(2-chlorophenyl)-9-cyclohexyl-2-ethyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-methoxyphenyl)urea,
N-(2-ethyl-9-methyl-4-(4-methylphenyl)-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-methylphenyl)urea,
N-(4-(2-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-phenylurea,
N-(2-ethyl-9-methyl-4-phenyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-methylphenyl)urea,
N-(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(2-methoxyphenyl)urea,
N-(4-(2-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-phenylthiourea,
N-(2-butyl-4-(4-chlorophenyl)-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-methylphenyl) urea,
N-(4-(2-chlorophenyl)-2-ethyl-9-cyclohexyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(2-methylphenyl)urea,
4-(4-chlorophenyl)-2-ethyl-9-methyl-6-(3-phenylpropyl)-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepine,
2-ethyl-4-phenyl-9-undecyl-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c][1,4]oxazepine,
6-(2-chlorophenyl)-1-undecyl-7,8,9,10-hexahydro-4H,6H-triazolo[3,4-c][1]benzothieno[2,3-e][1,4]-oxazepine
4-(2-chlorophenyl)-2-(2-(4-isobutylphenyl)ethyl)-9-methyl-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c]-[1,4]oxazepine,
4-(4-chlorophenyl)-2-ethyl-9-(3-(4-isobutylphenyl)propyl)-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c]-[1,4]oxazepine,
2-ethyl-9-heptyl-4-(4-methoxyphenyl)-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c][1,4]oxazepine,
2-ethyl-4-(4-methylphenyl)-9-undecyl-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c][1,4]oxazepine,
2-ethyl-4-(4-hydroxyphenyl)-9-undecyl-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c][1,4]oxazepine and
2-ethyl-4-(4-(2-dimethylaminoethoxy)phenyl)-9-undecyl-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c][1,4]-oxazepine, or a pharmaceutically acceptable salt thereof.

9. The therapeutic agent for osteoporosis according to Claim 1 or Claim 4, comprising, as an active ingredient, a compound of the formula (I) wherein the ring Q is a group of the formula



wherein R^{15} and R^{16} are as defined in Claim 1, or a pharmaceutically acceptable salt thereof,

10. The therapeutic agent for osteoporosis according to Claim 9, comprising, as an active ingredient, a compound of the formula (I) wherein the ring Q is a group of the formula



wherein R^{15} and R^{16} are as defined in Claim 1, W is $-N(R^{35})-$ where R^{35} is hydrogen or forms a bond with R^{35} or -O-, R is hydrogen, heteroarylalkyl or a group of the formulae selected from the group consisting of:

(3)

$-(CH_2)bN(R^{10})SO_2R^{44}$ (5)

$-(CH_2)bN(R^{10})COOR^{45}$ (6)

(7)

$-(CH_2)bOCOR^{46}$ (8)

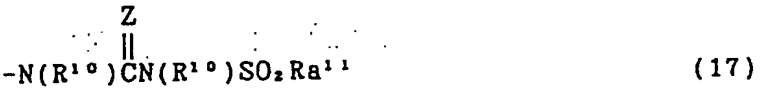
$-(CH_2)bCON(R^{47})(R^{48})$ (9)

$-(CH_2)bOSO_2R^{44}$ (10)

$-CON(R^{10})OR^8$ (13)

(14)

(16)

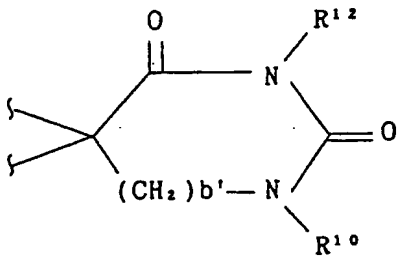


(17)

and

$-CON(R^{10})N(R^{10})(R^{11})$ (18)

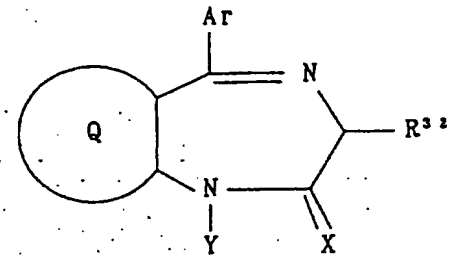
wherein each symbol is as defined in Claim 1, and R' is hydrogen or $-COOR^8$ wherein R^8 is as defined in Claim 1, or R and R' combinedly form a spiro ring of the formula



wherein each symbol is as defined in Claim 1, or a pharmaceutically acceptable salt thereof.

11. The therapeutic agent for osteoporosis according to Claim 1, comprising, as an active ingredient, a compound of the formula (I) which is selected from the group consisting of:
6-(4-chlorophenyl)-1-undecyl-4H,6H-[1,2,4]triazolo[4,3-a][1,4]benzoxazepine,
8-decyl-1,4-dimethyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
9-decyl-1,4-dimethyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
6-(4-chlorophenyl)-1-undecyl-4H[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
6-(4-chlorophenyl)-1-undecyl-4H,5H,6H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
6-(4-chlorophenyl)-1-(3-(isobutylphenyl)propyl)-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
N-benzoyl-N'-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(2-pyridyl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(3-pyridyl)urea,
N-(8-chloro-1-methyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(2-methoxyphenyl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(2-methoxyphenyl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(3-tolyl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-phenyl-oxalyldiamide,
N-(1-methyl-6-(2-thienyl)-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(3-tolyl)urea,
6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine-4-spiro-5'-(3'-(3-tolyl)-2',4'-dioxoimidazolidine),
N-(6-(4-chlorophenyl)-4-ethoxycarbonyl-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(3-tolyl)urea,
(1-methyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl-p-toluenesulfonate,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl-N'-(2-methoxyphenyl)urea,
N-[6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl]-N'-(3-tolyl)-urea,
N-(3-tolyl)-O-((1-methyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl)carbamate,
N-(2-methoxyphenyl)-O-((1-methyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl)-carbamate,
(1-methyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl phenylacetate,
6-(4-chlorophenyl)-4-(3-indolylmethyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-O-benzyl carbamate,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)benzylsulfonamide,
(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)carbohydrazide,
N'-p-tosyl-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-carbohydrazide,
O-benzyl-N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-carbohydroxamate,
N-benzyl-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine-1-yl)-carboxamide,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl-2-indolecarboxamide,
N-benzyl-N'-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(cyclohexyl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-2-indolecarboxamide,
8-chloro-6-(2-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
8-chloro-6-phenyl-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine and
8-chloro-6-(2-chlorophenyl)-4H-imidazo[1,2-a][1,4]benzodiazepine,
or a pharmaceutically acceptable salt thereof.

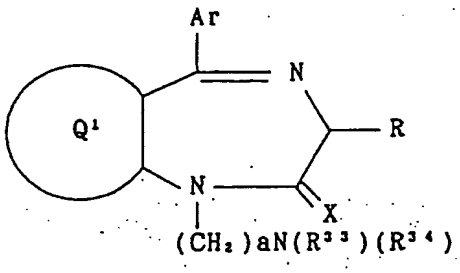
12. A diazepine compound of the formula



(II A)

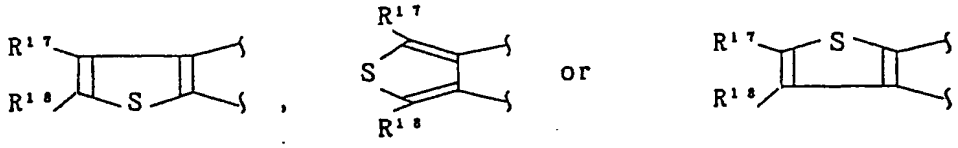
wherein R^{32} is optionally substituted phenyl or optionally substituted phenylalkyl and other symbols are as defined in Claim 1, or a pharmaceutically acceptable salt thereof.

13. A diazepine compound of the formula



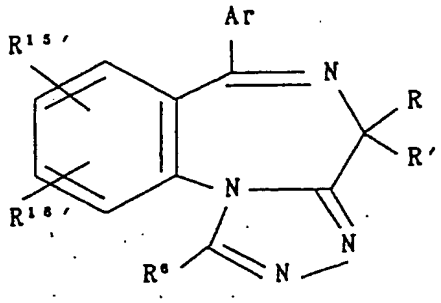
(III A)

wherein a is an integer of 1 to 6, R^{33} and R^{34} are the same or different and each is alkyl or aralkyl or R^{33} and R^{34} may combinedly form a 5 to 7-membered ring which may have, in the ring, nitrogen, sulfur or oxygen atom, the ring Q^1 is



wherein R^{17} and R^{18} are as defined in Claim 1, and other symbols are as defined in Claim 1, or a pharmaceutically acceptable salt thereof.

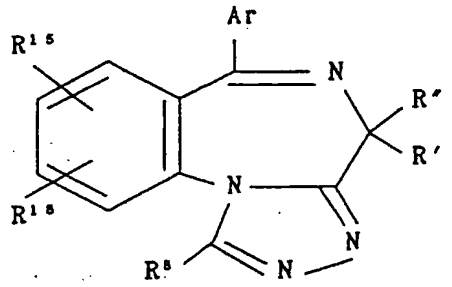
14. A benzotriazolodiazepine compound of the formula



(II B)

wherein $R^{15'}$ is alkyl or aralkyl having 8 to 15 carbon atoms, $R^{16'}$ is hydrogen and other symbols are as defined in Claim 1, or a pharmaceutically acceptable salt thereof.

15. A benzotriazolodiazepine compound of the formula



(ⅢB)

wherein R'' is a group of the formula selected from the group consisting of

-CON(R^{47})(R^{48}) (9')

-CON(R^{10})OR^{8} (13)

(14)

(16)

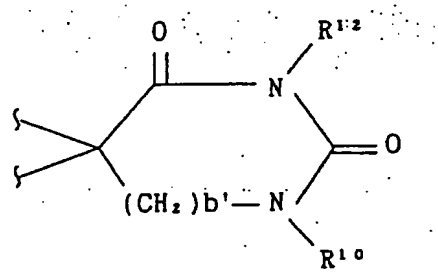
(17)

-CON(R^{10})N(R^{10})(R^{11}) (18)

and

-N(R^{10})CON(R^{10})Py (21)

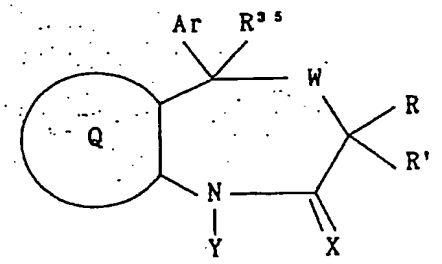
wherein Py is optionally substituted pyridyl and other symbols are as defined in Claim 1, R' is hydrogen or R'' and R' may combinedly form a spiro ring of the formula



wherein each symbol is as defined in Claim 1, and other symbols are as defined in Claim 1, or a pharmaceutically acceptable salt thereof.

16. The compound of Claim 14 or Claim 15, which is selected from the group consisting of:
8-decyl-1,4-dimethyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
9-decyl-1,4-dimethyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
N-benzoyl-N'-6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)urea,
N-(p-tosyl)-N'-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(2-pyridyl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(3-pyridyl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-phenyl-oxalyldiamide,
N-(1-methyl-6-(2-thienyl)-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(3-tolyl)urea,
6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine-4-spiro-5'-(3'-(3-tolyl)-2'-4'-dioxoimidazolidine),
N'-phenyl-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-carbohydrazide,
N'-benzoyl-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-carbohydrazide,
O-benzyl-N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-carbohydraxamate,
N-benzyl-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)carboxamide,
6-(4-chlorophenyl)-1-undecyl-4H,5H,6H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
(1-methyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl-p-toluenesulfonate,
(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)carbohydrazide,
N'-p-tosyl-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-carbohydrazide,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl-2-indolecarboxamide,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(cyclohexyl)urea and
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-2-indolecarboxamide,
or a pharmaceutically acceptable salt thereof.

17. A method for treating osteoporosis comprising administering an azepine compound or a pharmaceutically acceptable salt thereof of the formula



(I)

wherein
Ar is aryl or heteroaryl;
X is an oxygen atom or a sulfur atom;
Y is hydrogen, alkyl, alkenyl, alkynyl, $-(CH_2)aCOOR^1$
wherein R^1 is hydrogen, alkyl, aryl or aralkyl and a is an integer of 1 to 6, $-(CH_2)a$-cycloalkyl wherein a is an integer of 1 to 6, $-(CH_2)aN(R^2)(R^3)$ wherein a is an integer of 1 to 6 and R^2 and R^3 are the same or different and each is hydrogen, alkyl or aralkyl, or form, together with the adjacent nitrogen atom, a heterocycle, $-(CH_2)bCON(R^{41})(R^{42})$ wherein b is 0 or an integer of 1 to 6, and R^{41} and R^{42} are the

same or different and each is hydrogen, alkyl, aryl or aralkyl, or form, together with the adjacent nitrogen atom, a heterocycle, -(CH_2)aCN wherein a is an integer of 1 to 6, or -(CH_2)a$CR^4{}_3$ wherein a is an integer of 1 to 6 and R^4 is halogen, or

X and Y combinedly form =N-N=C(R^6)-, =N-C(R^5)=C(R^6)-, =C(R^5)-N=C(R^6)-, =N-O-CO- or =N-N(R^5)-CO- wherein R^5 and R^6 are each hydrogen, halogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkylalkyl, aryl, heteroaryl, aralkyl, heteroarylalkyl, aryloxyalkyl, -(CH_2)a$COOR^7$ wherein a is an integer of 1 to 6 and R^7 is hydrogen, alkyl, alkenyl or aralkyl, or -(CH_2)a$NHCOR^{43}$ wherein a is an integer of 1 to 6 and R^{43} is alkyl or aralkyl;

W is -N(R^{35})- wherein R^{35} is hydrogen or forms a bond with R^{35}, -O- or -S-;

R^{35} is hydrogen or forms a bond with R^{36};

R is hydrogen, alkyl, haloalkyl, aryl, heteroaryl, aralkyl, heteroarylalkyl or a group of the formula selected from the group consisting of:

-(CH_2)bN(R^8)(R^9) (1)

-(CH_2)bOR^{10} (2)

$$-(CH_2)bN(R^{10})\overset{\overset{Z}{\|}}{C}N(R^{11})(R^{12}) \quad (3)$$

-(CH_2)bN(R^{10})CORa^{11} (4)

-(CH_2)bN(R^{10})SO_2R^{44} (5)

-(CH_2)bN(R^{10})$COOR^{45}$ (6)

$$-(CH_2)bO\overset{\overset{Z}{\|}}{C}N(R^{11})(R^{12}) \quad (7)$$

-(CH_2)b$OCOR^{46}$ (8)

-(CH_2)bCON(R^{47})(R^{48}) (9)

-(CH_2)bOSO_2R^{44} (10)

-(CH_2)bCOR^{49} (11)

-(CH_2)bS(O)nR^{11} (12)

-CON(R^{10})OR^8 (13)

$$-CON(R^{10})N(R^{10})\overset{\overset{Z}{\|}}{C}Ra^{11} \quad (14)$$

-CON(R^{10})N(R^{10})SO_2Ra^{11} (15)

(16)

(17)

$-CON(R^{10})N(R^{10})(R^{11})$ (18)

$-(CH_2)bN(R^{10})COCON(R^{11})(R^{12})$ (19)

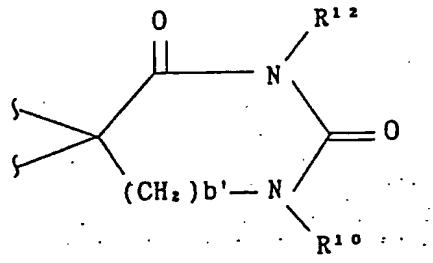
and

$-(CH_2)aCOOR^1$ (20)

wherein b is 0 or an integer of 1 to 6, Z is an oxygen atom or sulfur atom, R^8 and R^9 are the same or different and each is hydrogen, alkyl, aryl or aralkyl, R^{10} is hydrogen, alkyl or aralkyl, R^{11} and R^{12} are the same or different and each is hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, heteroaryl or heteroarylalkyl, Ra^{11} is alkyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, heteroaryl or heteroarylalkyl, R^{44} is alkyl, aryl, aralkyl, cycloalkyl or heteroaryl, R^{45} is alkyl, aryl or aralkyl, R^{46} is alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, heteroaryl or heteroarylalkyl, R^{47} and R^{48} are the same or different and each is hydrogen, alkyl, acyl, aryl or aralkyl, R^{49} is alkyl, aryl, aralkyl, heteroaryl or heteroarylalkyl, n is 0, 1 or 2, a is an integer of 1 to 6 and R^1 is hydrogen, alkyl, aryl or aralkyl;

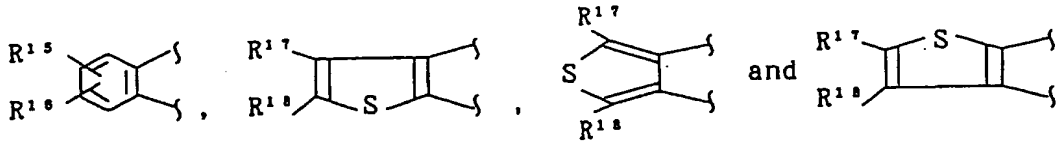
R' is hydrogen or $-COOR^8$ wherein R^8 is hydrogen, alkyl, aryl or aralkyl, or

R and R' combinedly form a spiro ring of the formula



wherein b' is 0 or 1, R^{10} is hydrogen, alkyl or aralkyl and R^{12} is hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, heteroaryl or heteroarylalkyl;

ring Q is a ring selected from



wherein R^{15} and R^{16} are the same or different and each is hydrogen, halogen, alkyl optionally substituted by halogen, alkoxy, nitro, amino, amino substituted by alkyl, cyclic amino, hydroxy, acyloxy, cyano, carbamoyl, carbamoyl substituted by alkyl, cyclic aminocarbonyl, carboxyl, alkoxycarbonyl or aralkyloxycarbonyl, aralkyl, aralkyl substituted by alkyl, alkoxy, nitro, amino, amino substituted by alkyl, cyclic amino, hydroxy, acyloxy, cyano, carbamoyl, carbamoyl substituted by alkyl, cyclic aminocarbonyl, carboxyl, alkoxycarbonyl or aralkyloxycarbonyl,

R^{17} and R^{18} are the same or different and each is hydrogen, halogen, alkyl, alkenyl, alkynyl, haloalkyl, alkoxy, nitro, amino, amino substituted by alkyl, cyclic amino, hydroxy, acyloxy, cyano, carbamoyl, carbamoyl substituted by alkyl, cyclic aminocarbonyl, carboxyl, alkoxycarbonyl, aralkyloxycarbonyl, cycloalkyl, alkylcarbonyl, a group of the formula

R^{19}-A-

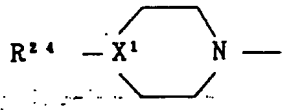
wherein A is alkylene, alkenylene or alkynylene which may be substituted by 1 to 3 hydroxys and R^{19} is alkoxy, nitro, amino, hydroxy, acyloxy, cyano, carboxyl, alkoxycarbonyl, aralkyloxycarbonyl, phenyl optionally substituted by 1 to 3 substituents (e.g. halogen, hydroxy, alkyl, alkoxy, aryl, aryloxy, aralkyl, aralkyloxy, alkenyl or alkynyl having 2 to 18 carbon atoms, which may be substituted by 1 to 3 hydroxys, aralkenyl or aralkynyl having alkenyl moiety or alkynyl moiety having 2 to 18 carbon atoms, which may be substituted by 1 to 3 hydroxys), a group of the formula

$(R^{20})(R^{21})NCO$- or $(R^{20})(R^{21})N$-SO_2-

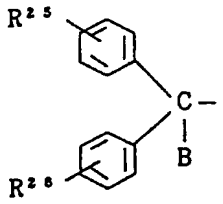
wherein R^{20} and R^{21} are the same or different and each is hydrogen, aryl, aralkyl or straight- or branched chain alkyl, alkenyl or alkynyl which may be substituted by halogen, hydroxy, nitro, amino or substituted amino, or R^{20} and R^{21} may, together with the adjacent nitrogen atom, form a 3 to 7-membered ring which may be substituted by straight- or branched chain alkyl and may have, in the ring, nitrogen, oxygen or sulfur atom as a hetero atom (the additional nitrogen atom may be substituted by straight- or branched chain alkyl having 1 to 4 carbon atoms, aralkyl or diarylalkyl), a group of the formula

$(R^{22})(R^{23})N$-

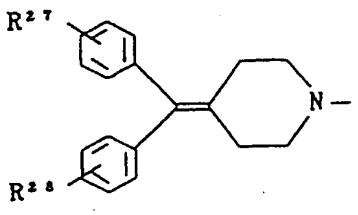
wherein R^{22} and R^{23} are the same or different and each is hydrogen, straight- or branched chain alkyl, alkenyl or alkynyl, which may be substituted by halogen, hydroxy, amino, alkylamino, dialkylamino, cyclic amino or C-bonded heterocyclic group (carbons may be interrupted by nitrogen, oxygen or sulfur atom), straight- or branched chain alkylcarbonyl which may be mono- or di-substituted by hydroxy, halogen, amino, alkylamino, dialkylamino, cyclic amino or straight- or branched chain alkyl (this alkyl may be substituted by halogen or hydroxy), arylcarbonyl, arylsulfonyl, alkylsulfonyl, or R^{22} and R^{23} may form, together with the adjacent nitrogen atom, a saturated or unsaturated 3 to 7-membered ring which may be substituted by straight- or branched chain alkyl and may have, in the ring, nitrogen, oxygen or sulfur atom as a hetero atom (each additional nitrogen atom may be substituted by straight- or branched chain alkyl), a group of the formula



wherein R^{24} is aryl, aralkyl, arylcarbonyl, a group of the formula



wherein R^{25} and R^{26} are the same or different and each is hydrogen, halogen, haloalkyl, amino, nitro, cyano, hydroxy, alkyl or alkoxy and B is hydrogen, hydroxy or esterified hydroxy, or alkyl having hydroxy and/or carbonyl and X^1 is CH or nitrogen atom, or a group of the formula



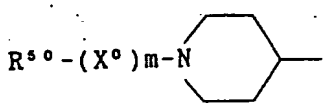
wherein R^{27} and R^{28} are the same or different and each is hydrogen, halogen, haloalkyl, amino, nitro, cyano, hydroxy, alkyl or alkoxy,
a group of the formula

R^{29}-(CH_2)d-C≡C-

wherein R^{29} is aryl or optionally hydrogenated heteroaryl and d is 0, 1 or 2, a group of the formula

R^{29}-O-(CH_2)e-C≡C-

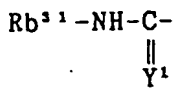
wherein R^{29} is as defined above and e is 1 or 2, or a group of the formula



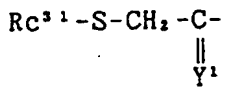
wherein X^0 is -OCO-, -CO- or -N(R^{51})CO- where R^{51} is hydrogen or alkyl, m is 0 or 1, R^{50} is alkyl, alkynyl, 2-phenylethynyl, 2-thienylsulfonyl, -(CH_2)aCN where a is an integer of 1 to 6, -(CH_2)b-R^{52} where b is 0 or an integer of 1 to 6 and R^{52} is cycloalkyl, morphlino, thienyl, alkoxy, aryl, imidazolyl or tetrahydropyranyl or -SO_2N(R^{53})(R^{54}) where R^{53} and R^{54} are the same or different and each is hydrogen, alkyl, or R^{53} and R^{54}, with the adjacent nitrogen atom, form a heterocycle, or

adjacent R^{17} and R^{18} may combinedly form a saturated or unsaturated 5, 6 or 7-membered ring which is condensed to thiophene ring, said ring being optionally substituted by a substituent Ra^{30} selected from hydrogen, halogen, alkyl, a group of the formula R^{19}-A- wherein each symbol is as defined above and a group of the formula (R^{20})(R^{21})NCO- or (R^{20})(R^{21})N-SO_2- wherein each symbol is as defined above, or R^{17} and R^{18} may combinedly form a 5, 6 or 7-membered hetero ring which may have oxygen, sulfur or -N(Rb^{30})- as a hetero atom;

examples of Rb^{30} include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, alkoxycarbonyl, alkanoyl, aroyl, cycloalkylcarbonyl, cycloalkoxycarbonyl, cycloalkylalkylcarbonyl cycloalkylalkoxycarbonyl,cycloalkylaminocarbonyl, a group of the formula R^{19}-A- wherein each symbol is as defined above, a group of the formula (R^{20})(R^{21})NCO- wherein each symbol is as defined above, a group of the formula (R^{20})(R^{21})N-SO_2- wherein each symbol is as defined above, a group of the formula Ra^{31}-SO_2- wherein Ra^{31} is alkyl, phenyl, phenyl substituted by halogen, alkyl, alkoxy, carboxy, alkylsulfonyl, alkylthio, haloalkyl or optionally substituted phenoxy, heteroaryl or naphthyl, a group of the formula



wherein Y^1 is oxygen atom or sulfur atom and Rb^{31} is alkenyl, alkyl, cycloalkyl, aryl, aralkyl, heteroaryl, heteroarylalkyl, phenyl substituted by 1 to 3 substituents selected from alkyl, alkoxy, aryloxy, alkylsulfonyl, halogen and haloalkyl, quinolyl or sulfonyl substituted by phenyl, heteroaryl or naphthyl, or a group of the formula



wherein Y^1 is oxygen atom or sulfur atom and Rc^{31} is alkyl, phenyl substituted by phenyl, halogen, alkyl, alkoxy, haloalkyl or optionally substituted phenoxy, or heteroaryl;

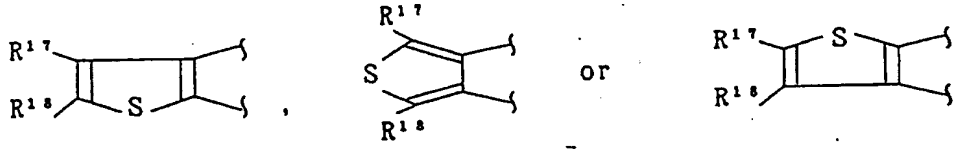
in the above definitions, aryl, aryloxy, aryloxyalkyl, arylcarbonyl, arylsulfonyl, aralkyl, aralkyloxy, aralkyloxycarbonyl, aralkenyl, aralkynyl, diarylalkyl, heteroaryl and heteroarylalkyl may have, on the ring, 1 to 3 substituents selected from halogen, alkyl, alkoxy, haloalkyl, hydroxy, nitro, amino, cyano and acyloxy; cycloalkyl of cycloalkyl, cycloalkylalkyl, cycloalkylcarbonyl, cycloalkylalkylcarbonyl, cycloalkoxycarbonyl, cycloalkylalkoxycarbonyl and cycloalkylaminocarbonyl may have 1 to 3 substituents selected from halogen, alkyl, alkoxy, haloalkoxy and aryl.

18. The method for treating osteoporosis according to Claim 17, comprising administering a compound of the formula (I) wherein W is $-N(R^{36})-$ where R^{36} forms a bond with R^{35}, or a pharmaceutically acceptable salt thereof.

19. The method for treating osteoporosis according to Claim 17, comprising administering a compound of the formula (I) wherein W is $-N(R^{36})-$ where R^{36} forms a bond with R^{35} and X and Y combinedly form $=N-N=C(R^6)-$ where R^6 is as defined in Claim 17, or a pharmaceutically acceptable salt thereof.

20. The method for treating osteoporosis according to Claim 17, comprising administering a compound of the formula (I) wherein W is $-N(R^{36})-$ where R^{36} forms a bond with R^{35} and X and Y combinedly form $=N-N=C(R^{6'})-$ where $R^{6'}$ is alkyl having 6 to 20 carbon atoms, or a pharmaceutically acceptable salt thereof.

21. The method for treating osteoporosis according to Claim 17 or Claim 19, comprising administering a compound of the formula (I) wherein the ring Q is

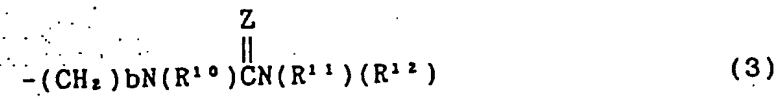


wherein R^{17} and R^{18} are as defined in Claim 17, or a pharmaceutically acceptable salt thereof.

22. The method for treating osteoporosis according to Claim 21, comprising administering a compound of the formula (I) wherein W is $-N(R^{36})-$ where R^{36} forms a bond with R^{35}, R is alkyl, aryl, heteroaryl, aralkyl, heteroarylalkyl or a group of the formula selected from the group consisting of:

$-(CH_2)bN(R^8)(R^9)$ (1)

$-(CH_2)bOR^{10}$ (2)



(3)

$-(CH_2)bN(R^{10})CORa^{11}$ (4)

$-(CH_2)bN(R^{10})SO_2R^{44}$ (5)

$-(CH_2)bN(R^{10})COOR^{45}$ (6)

$$-(CH_2)bOCN(R^{11})(R^{12}) \quad (7)$$

$-(CH_2)bOCOR^{45}$ (8)

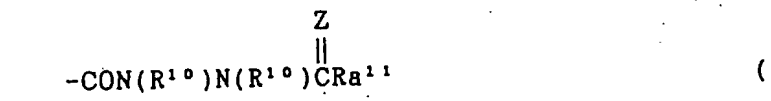
$-(CH_2)bCON(R^{47})(R^{48})$ (9)

$-(CH_2)bOSO_2R^{44}$ (10)

$-(CH_2)bCOR^{49}$ (11)

$-(CH_2)bS(O)nR^{11}$ (12)

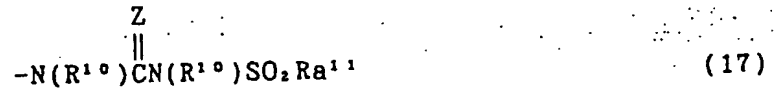
$-CON(R^{10})OR^{8}$ (13)



$$-CON(R^{10})N(R^{10})CRa^{11} \quad (14)$$

$-CON(R^{10})N(R^{10})SO_2Ra^{11}$ (15)

$$-N(R^{10})CN(R^{10})CORa^{11} \quad (16)$$



$$-N(R^{10})CN(R^{10})SO_2Ra^{11} \quad (17)$$

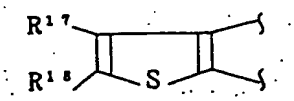
$-CON(R^{10})N(R^{10})(R^{11})$ (18)

$-(CH_2)bN(R^{10})COCON(R^{11})(R^{12})$ (19)

and

$-(CH_2)aCOOR^{1}$ (20)

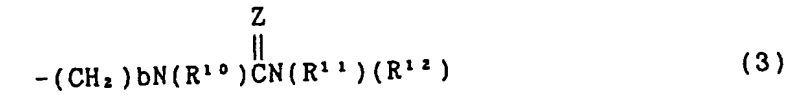
wherein each symbol is as defined in Claim 17 and the ring Q is a group of the formula



wherein each symbol is as defined in Claim 17, or a pharmaceutically acceptable salt thereof.

23. The method for treating osteoporosis according to Claim 21, comprising administering a compound of the formula (I) wherein W is $-N(R^{35})-$ wherein R^{36} forms a bond with R^{35}, R is alkyl, aryl, aralkyl or a group of the formula selected from the group consisting of:

$-(CH_2)bN(R^{8})(R^{9})$ (1)

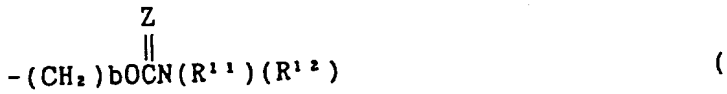


(3)

$-(CH_2)bN(R^{10})COR^{11}$ (4)

$-(CH_2)bN(R^{10})SO_2R^{44}$ (5)

$-(CH_2)bN(R^{10})COOR^{45}$ (6)



(7)

$-(CH_2)bCON(R^{47})(R^{48})$ (9)

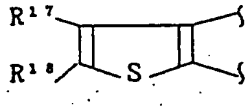
$-(CH_2)bOSO_2R^{44}$ (10)

$-(CH_2)bCOR^{49}$ (11)

and

$-(CH_2)aCOOR^{1}$ (20)

wherein each symbol is as defined in Claim 17 and the ring Q is a group of the formula



wherein each symbol is as defined in Claim 17, or a pharmaceutically acceptable salt thereof.

24. The method for treating osteoporosis according to Claim 17, comprising administering a compound of the formula (I) which is selected from the group consisting of:

9-tert-butyl-4-(2-chlorophenyl)-2-(2-(4-isobutylphenyl)ethyl)-6-methyl-6H-thieno[3,2-f][1,2,4]triazolo-[4,3-a][1,4]diazepine,

3-[4-(2-chlorophenyl)-6,9-dimethyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-2-yl]propionic morpholide,

4-(2-chlorophenyl)-6,9-dimethyl-2(3-morpholinopropyl)-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepine,

4-(2-chlorophenyl)-2-(2-(4-isobutylphenyl)ethyl)-9-methyl-6-propyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepine,

4-(2-chlorophenyl)-6-isobutyl-2-(2-(4-isobutylphenyl)ethyl)-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo-[4,3-a][1,4]diazepine,

4-(2-chlorophenyl)-2-(2-(4-isobutylphenyl)ethyl)-9-methyl-6-phenyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepine,

6-benzyl-4-(2-chlorophenyl)-2-(2-(4-isobutylphenyl)ethyl)-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepine,

N-(4-(2-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-2-indolecarboxamide,

N-(4-(2-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-3-indoleacetamide,

6-benzoylamino-4-(2-chlorophenyl)2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepine,

4-(2-chlorophenyl)-2-ethyl-9-methyl-6-(3-(3-tolyl)ureido)-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepine,

8S-(+)-6-(2-chlorophenyl)-3-cyclopropanecarbonyl-8,11-dimethyl-2,3,4,5-tetrahydro-8H-pyrido-[4',3':4,5]thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepine,

6-(2-chlorophenyl)-8,9-dihydro-1,4-dimethyl-8-morpholinocarbonyl-4H,7H-cyclopenta[4,5]thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepine,

(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)acetic acid,

N-(2-methoxyphenyl)-(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepin-6-yl)acetamide,

N-phenyl-(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)acetamide,

N-(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-p-toluenesulfonamide,

(4-(4-methoxyphenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N-(3-methylphenyl)carbamate,

4-(2-chlorophenyl)-2-ethyl-9-methyl-6-phenylacetylamino-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepine,

N-(4-chlorophenyl)-N'-(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepin-6-yl)urea,

N-(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-methoxyphenyl)urea,

N-(4-(4-chlorophenyl)-2-hexyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-methylphenyl)urea,

N-(4-(2-chlorophenyl)-2,3,9-trimethyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-methylphenyl)urea,

N-(4-(2-chlorophenyl)-9-cyclohexyl-2-ethyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-methoxyphenyl)urea,

N-(2-ethyl-9-methyl-4-(4-methylphenyl)-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-methylphenyl)urea,

N-(4-(2-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-phenylurea,

N-(2-ethyl-9-methyl-4-phenyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-methylphenyl)urea,

N-(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(2-methoxyphenyl)urea,

N-(4-(2-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-phenylthiourea,

N-(2-butyl-4-(4-chlorophenyl)-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-methylphenyl) urea,

N-(4-(2-chlorophenyl)-2-ethyl-9-cyclohexyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(2-methylphenyl)urea,

4-(4-chlorophenyl)-2-ethyl-9-methyl-6-(3-phenylpropyl)-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepine,

2-ethyl-4-phenyl-9-undecyl-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c][1,4]oxazepine,

6-(2-chlorophenyl)-1-undecyl-7,8,9,10-hexahydro-4H,6H-triazolo[3,4-c][1]benzothieno[2,3-e][1,4]-oxazepine,

4-(2-chlorophenyl)-2-(2-(4-isobutylphenyl)ethyl)-9-methyl-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c]-[1,4]oxazepine,

4-(4-chlorophenyl)-2-ethyl-9-(3-(4-isobutylphenyl)propyl)-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c]-[1,4]oxazepine,

2-ethyl-9-heptyl-4-(4-methoxyphenyl)-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c][1,4]oxazepine,

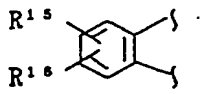
2-ethyl-4-(4-methylphenyl)-9-undecyl-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c][1,4]oxazepine,

2-ethyl-4-(4-hydroxyphenyl)-9-undecyl-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c][1,4]oxazepine and

2-ethyl-4-(4-(2-dimethylaminoethoxy)phenyl)-9-undecyl-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c][1,4]-oxazepine,

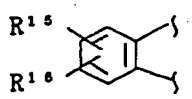
or a pharmaceutically acceptable salt thereof.

25. The method for treating osteoporosis according to Claim 17 or Claim 20, comprising administering a compound of the formula (I) wherein the ring Q is a group of the formula

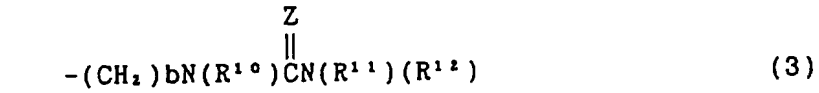


wherein R^{15} and R^{16} are as defined in Claim 17, or a pharmaceutically acceptable salt thereof.

26. The method for treating osteoporosis according to Claim 25, comprising administering a compound of the formula (I) wherein the ring Q is a group of the formula

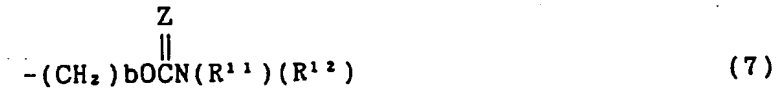


wherein R^{15} and R^{16} are as defined in Claim 17, W is $-N(R^{36})-$ where R^{36} is hydrogen or forms a bond with R^{35} or -O-, R is hydrogen, heteroarylalkyl or a group of the formula selected from the group consisting of:



$-(CH_2)bN(R^{10})SO_2R^{44}$ (5)

$-(CH_2)bN(R^{10})COOR^{45}$ (6)

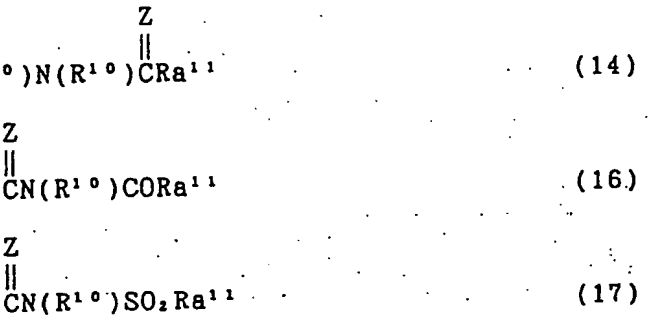


$-(CH_2)bOCOR^{46}$ (8)

$-(CH_2)bCON(R^{47})(R^{48})$ (9)

$-(CH_2)bOSO_2R^{44}$ (10)

$-CON(R^{10})OR^{8}$ (13)



(14)

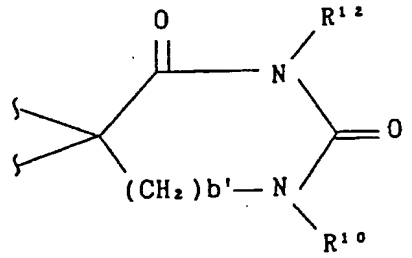
(16)

(17)

and

(18)

wherein each symbol is as defined in Claim 17, and R' is hydrogen or -COOR^8 wherein R^8 is as defined in Claim 17, or R and R' combinedly form a spiro ring of the formula

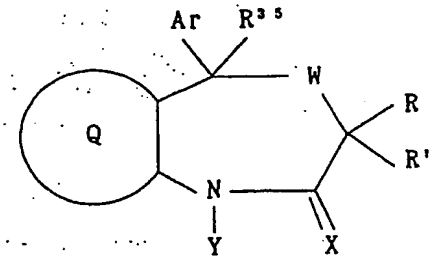


wherein each symbol is as defined in Claim 17, or a pharmaceutically acceptable salt thereof.

27. The method for treating osteoporosis according to Claim 17, comprising administering a compound of the formula (I) which is selected from the group consisting of:
6-(4-chlorophenyl)-1-undecyl-4H,6H-[1,2,4]triazol[4,3-a][1,4]benzoxazepine,
8-decyl-1,4-dimethyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
9-decyl-1,4-dimethyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
6-(4-chlorophenyl)-1-undecyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
6-(4-chlorophenyl)-1-undecyl-4H,5H,6H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
6-(4-chlorophenyl)-1-(3-(isobutylphenyl)propyl)-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
N-benzoyl-N'-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(2-pyridyl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(3-pyridyl)urea,
N-(8-chloro-1-methyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(2-methoxyphenyl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(2-methoxyphenyl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(3-tolyl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-phenyl-oxalyldiamide,
N-(1-(methyl-6-(2-thienyl)-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(3-tolyl)urea,
6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine-4-spiro-5'-(3'-(3-tolyl)-2',4'-dioxoimidazolidine),
N-(6-(4-chlorophenyl)-4-ethoxycarbonyl-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(3-tolyl)urea,

(1-methyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl-p-toluenesulfonate,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl-N'-(2-methoxyphenyl)urea,
N-[6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl]-N'-(3-tolyl)-urea,
N-(3-tolyl)-O-((1-methyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl)carbamate,
N-(2-methoxyphenyl)-O-((1-methyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl)-carbamate,
(1-methyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl phenylacetate,
6-(4-chlorophenyl)-4-(3-indolylmethyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-O-benzyl carbamate,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)benzylsulfonamide,
(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)carbohydrazide,
N'-p-tosyl-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-carbohydrazide,
O-benzyl-N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-carbohydroxamate,
N-benzyl-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine-1-yl)-carboxamide,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl-2-indolecarboxamide,
N-benzyl-N'-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(cyclohexyl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-2-indolecarboxamide,
8-chloro-6-(2-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
8-chloro-6-phenyl-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine and
8-chloro-6-(2-chlorophenyl)-4H-imidazo[1,2-a][1,4]benzodiazepine,
or a pharmaceutically acceptable salt thereof.

28. A use for producing a therapeutic agent for osteoporosis, of an azepine compound or a pharmaceutically acceptable salt thereof of the formula



(I)

wherein
Ar is aryl or heteroaryl;
X is an oxygen atom or a sulfur atom;
Y is hydrogen, alkyl, alkenyl, alkynyl, $-(CH_2)aCOOR^1$
wherein R^1 is hydrogen, alkyl, aryl or aralkyl and a is an integer of 1 to 6, $-(CH_2)a$-cycloalkyl wherein a is an integer of 1 to 6, $-(CH_2)aN(R^2)(R^3)$ wherein a is an integer of 1 to 6 and R^2 and R^3 are the same or different and each is hydrogen, alkyl or aralkyl, or form, together with the adjacent nitrogen atom, a heterocycle, $-(CH_2)bCON(R^{41})(R^{42})$ wherein b is 0 or an integer of 1 to 6, and R^{41} and R^{42} are the same or different and each is hydrogen, alkyl, aryl or aralkyl, or form, together with the adjacent nitrogen atom, a heterocycle, $-(CH_2)aCN$ wherein a is an integer of 1 to 6, or $-(CH_2)aCR^4{}_3$ wherein a is an integer of 1 to 6 and R^4 is halogen, or

X and Y combinedly form $=N-N=C(R^6)-$, $=N-C(R^5)=C(R^6)-$, $=C(R^5)-N=C(R^6)-$, $=N-O-CO-$ or $=N-N(R^5)-CO-$ wherein R^5 and R^6 are each hydrogen, halogen, alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkylalkyl, aryl, heteroaryl, aralkyl, heteroarylalkyl, aryloxyalkyl, $-(CH_2)aCOOR^7$ wherein a is an integer of 1 to 6 and R^7 is hydrogen, alkyl, alkenyl or aralkyl, or $-(CH_2)aNHCOR^{43}$ wherein a is an integer of 1 to 6 and R^{43} is alkyl or aralkyl;

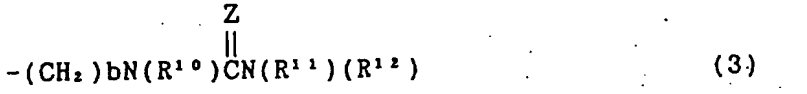
W is $-N(R^{36})-$ wherein R^{36} is hydrogen or forms a bond with R^{35}, -O- or -S-;

R^{35} is hydrogen or forms a bond with R^{36};

R is hydrogen, alkyl, haloalkyl, aryl, heteroaryl, aralkyl, heteroarylalkyl or a group of the formula selected from the group consisting of:

$-(CH_2)bN(R^8)(R^9)$ (1)

$-(CH_2)bOR^{10}$ (2)

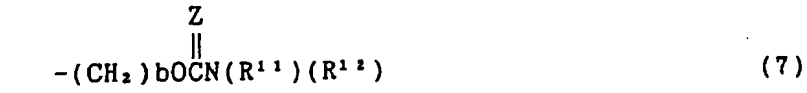


(3)

$-(CH_2)bN(R^{10})CORa^{11}$ (4)

$-(CH_2)bN(R^{10})SO_2R^{44}$ (5)

$-(CH_2)bN(R^{10})COOR^{45}$ (6)



(7)

$-(CH_2)bOCOR^{46}$ (8)

$-(CH_2)bCON(R^{47})(R^{48})$ (9)

$-(CH_2)bOSO_2R^{44}$ (10)

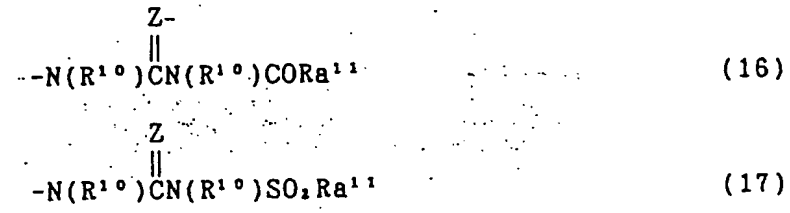
$-(CH_2)bCOR^{49}$ (11)

$-(CH_2)bS(O)nR^{11}$ (12)

$-CON(R^{10})OR^8$ (13)

(14)

$-CON(R^{10})N(R^{10})SO_2Ra^{11}$ (15)



(16)

(17)

$-CON(R^{10})N(R^{10})(R^{11})$ (18)

$-(CH_2)bN(R^{10})COCON(R^{11})(R^{12})$ (19)

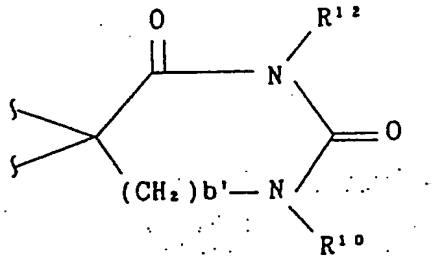
and

$-(CH_2)aCOOR^1$ (20)

wherein b is 0 or an integer of 1 to 6, Z is an oxygen atom or sulfur atom, R^8 and R^9 are the same or different and each is hydrogen, alkyl, aryl or aralkyl, R^{10} is hydrogen, alkyl or aralkyl, R^{11} and R^{12} are the same or different and each is hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, heteroaryl or heteroarylalkyl, Ra^{11} is alkyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, heteroaryl or heteroarylalkyl, R^{44} is alkyl, aryl, aralkyl, cycloalkyl or heteroaryl, R^{45} is alkyl, aryl or aralkyl, R^{46} is alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, heteroaryl or heteroarylalkyl, R^{47} and R^{48} are the same or different and each is hydrogen, alkyl, acyl, aryl or aralkyl, R^{49} is alkyl, aryl, aralkyl, heteroaryl or heteroarylalkyl, n is 0, 1 or 2, a is an integer of 1 to 6 and R^1 is hydrogen, alkyl, aryl or aralkyl;

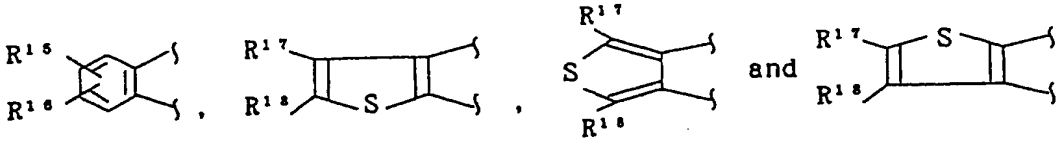
R' is hydrogen or $-COOR^8$ wherein R^8 is hydrogen, alkyl, aryl or aralkyl, or

R and R' combinedly form a spiro ring of the formula



wherein b' is 0 or 1, R^{10} is hydrogen, alkyl or aralkyl and R^{12} is hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, heteroaryl or heteroarylalkyl;

ring Q is a ring selected from the group consisting of:



wherein R^{15} and R^{16} are the same or different and each is hydrogen, halogen, alkyl optionally substituted by halogen, alkoxy, nitro, amino, amino substituted by alkyl, cyclic amino, hydroxy, acyloxy, cyano, carbamoyl, carbamoyl substituted by alkyl, cyclic aminocarbonyl, carboxyl, alkoxycarbonyl or aralkyloxycarbonyl, aralkyl, aralkyl substituted by alkyl, alkoxy, nitro, amino, amino substituted by alkyl, cyclic amino, hydroxy, acyloxy, cyano, carbamoyl, carbamoyl substituted by alkyl, cyclic aminocarbonyl, carboxyl, alkoxycarbonyl or aralkyloxycarbonyl,

R^{17} and R^{18} are the same or different and each is hydrogen, halogen, alkyl, alkenyl, alkynyl, haloalkyl, alkoxy, nitro, amino, amino substituted by alkyl, cyclic amino, hydroxy, acyloxy, cyano, carbamoyl, carbamoyl substituted by alkyl, cyclic aminocarbonyl, carboxyl, alkoxycarbonyl, aralkyloxycarbonyl, cycloalkyl, alkylcarbonyl, a group of the formula

R^{19}-A-

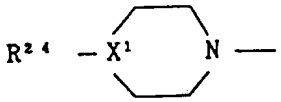
wherein A is alkylene, alkenylene or alkynylene which may be substituted by 1 to 3 hydroxys and R^{19} is alkoxy, nitro, amino, hydroxy, acyloxy, cyano, carboxyl, alkoxycarbonyl, aralkyloxycarbonyl, phenyl optionally substituted by 1 to 3 substituents (e.g. halogen, hydroxy, alkyl, alkoxy, aryl, aryloxy, aralkyl, aralkyloxy, alkenyl or alkynyl having 2 to 18 carbon atoms, which may be substituted by 1 to 3 hydroxys, aralkenyl or aralkynyl having alkenyl moiety or alkynyl moiety having 2 to 18 carbon atoms, which may be substituted by 1 to 3 hydroxys), a group of the formula

$(R^{20})(R^{21})NCO$- or $(R^{20})(R^{21})N\text{-}SO_2$-

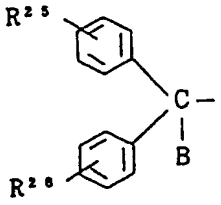
wherein R^{20} and R^{21} are the same or different and each is hydrogen, aryl, aralkyl or straight- or branched chain alkyl, alkenyl or alkynyl which may be substituted by halogen, hydroxy, nitro, amino or substituted amino, or R^{20} and R^{21} may, together with the adjacent nitrogen atom, form a 3 to 7-membered ring which may be substituted by straight- or branched chain alkyl and may have, in the ring, nitrogen, oxygen or sulfur atom as a hetero atom (the additional nitrogen atom may be substituted by straight- or branched chain alkyl having 1 to 4 carbon atoms, aralkyl or diarylalkyl), a group of the formula

$(R^{22})(R^{23})N$-

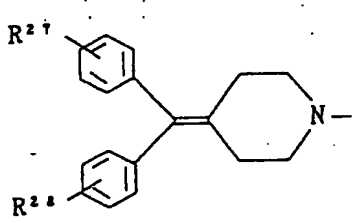
wherein R^{22} and R^{23} are the same or different and each is hydrogen, straight- or branched chain alkyl, alkenyl or alkynyl, which may be substituted by halogen, hydroxy, amino, alkylamino, dialkylamino, cyclic amino or C-bonded heterocyclic group (carbons may be interrupted by nitrogen, oxygen or sulfur atom), straight- or branched chain alkylcarbonyl which may be mono- or di-substituted by hydroxy, halogen, amino, alkylamino, dialkylamino, cyclic amino or straight- or branched chain alkyl (this alkyl may be substituted by halogen or hydroxy), arylcarbonyl, arylsulfonyl, alkylsulfonyl, or R^{22} and R^{23} may form, together with the adjacent nitrogen atom, a saturated or unsaturated 3 to 7-membered ring which may be substituted by straight- or branched chain alkyl and may have, in the ring, nitrogen, oxygen or sulfur atom as a hetero atom (each additional nitrogen atom may be substituted by straight- or branched chain alkyl), a group of the formula



wherein R^{24} is aryl, aralkyl, arylcarbonyl, a group of the formula



wherein R^{25} and R^{26} are the same or different and each is hydrogen, halogen, haloalkyl, amino, nitro, cyano, hydroxy, alkyl or alkoxy and B is hydrogen, hydroxy or esterified hydroxy, or alkyl having hydroxy and/or carbonyl and X^1 is CH or nitrogen atom, or a group of the formula



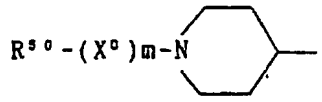
wherein R^{27} and R^{28} are the same or different and each is hydrogen, halogen, haloalkyl, amino, nitro, cyano, hydroxy, alkyl or alkoxy,
a group of the formula

R^{29}-(CH_2)d-C≡C-

wherein R^{29} is aryl or optionally hydrogenated heteroaryl and d is 0, 1 or 2, a group of the formula

R^{29}-O-(CH_2)e-C≡C-

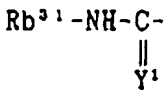
wherein R^{29} is as defined above and e is 1 or 2, or a group of the formula



wherein X^0 is -OCO-, -CO- or -N(R^{51})CO- where R^{51} is hydrogen or alkyl, m is 0 or 1, R^{50} is alkyl, alkynyl, 2-phenylethynyl, 2-thienylsulfonyl, -(CH_2)aCN where a is an integer of 1 to 6, -(CH_2)b-R^{52} where b is 0 or an integer of 1 to 6 and R^{52} is cycloalkyl, morphlino, thienyl, alkoxy, aryl, imidazolyl or tetrahydropyranyl or -SO_2N(R^{53})(R^{54}) where R^{53} and R^{54} are the same or different and each is hydrogen, alkyl, or R^{53} and R^{54}, with the adjacent nitrogen atom, form a heterocycle or

adjacent R^{17} and R^{18} may combinedly form a saturated or unsaturated 5, 6 or 7-membered ring which is condensed to thiophene ring, said ring being optionally substituted by a substituent Ra^{30} selected from hydrogen, halogen, alkyl, a group of the formula R^{19}-A- wherein each symbol is as defined above and a group of the formula (R^{20})(R^{21})NCO- or (R^{20})(R^{21})N-SO_2- wherein each symbol is as defined above, or $R^{17}$and R^{18} may combinedly form a 5, 6 or 7-membered hetero ring which may have oxygen, sulfur or -N(Rb^{30})- as a hetero atom;

examples of Rb^{30} include hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, alkoxycarbonyl, alkanoyl, aroyl, cycloalkylcarbonyl, cycloalkoxycarbonyl, cycloalkylalkylcarbonyl, cycloalkylalkoxycarbonyl, cycloalkylaminocarbonyl, a group of the formula R^{19}-A- wherein each symbol is as defined above, a group of the formula (R^{20})(R^{21})NCO- wherein each symbol is as defined above, a group of the formula (R^{20})(R^{21})N-SO_2- wherein each symbol is as defined above, a group of the formula Ra^{31}-SO_2- wherein Ra^{31} is alkyl, phenyl, phenyl substituted by halogen, alkyl, alkoxy, carboxy, alkylsulfonyl, alkylthio, haloalkyl or optionally substituted phenoxy, heteroaryl or naphthyl, a group of the formula



wherein Y^1 is oxygen atom or sulfur atom and Rb^{31} is alkenyl, alkyl, cycloalkyl, aryl, aralkyl, heteroaryl, heteroarylalkyl, phenyl substituted by 1 to 3 substituents selected from alkyl, alkoxy, aryloxy, alkylsulfonyl, halogen and haloalkyl, quinolyl or sulfonyl substituted by phenyl, heteroaryl or naphthyl, or a group of the formula

$$Rc^{31}-S-CH_2-C-$$
$$\qquad\qquad\qquad\qquad\quad \| \\ \qquad\qquad\qquad\qquad\quad Y^1$$

wherein Y^1 is oxygen atom or sulfur atom and Rc^{31} is alkyl, phenyl substituted by phenyl, halogen, alkyl, alkoxy, haloalkyl or optionally substituted phenoxy, or heteroaryl;

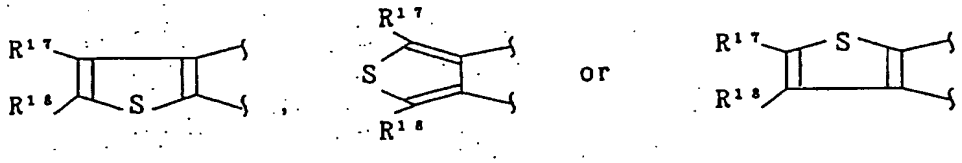
in the above definitions, aryl, aryloxy, aryloxyalkyl, arylcarbonyl, arylsulfonyl, aralkyl, aralkyloxy, aralkyloxycarbonyl, aralkenyl, aralkynyl, diarylalkyl, heteroaryl and heteroarylalkyl may have, on the ring, 1 to 3 substituents selected from halogen, alkyl, alkoxy, haloalkyl, hydroxy, nitro, amino, cyano and acyloxy; cycloalkyl of cycloalkyl, cycloalkylalkyl, cycloalkylcarbonyl, cycloalkylalkylcarbonyl, cycloalkoxycarbonyl, cycloalkylalkoxycarbonyl and cycloalkylaminocarbonyl may have 1 to 3 substituents selected from halogen, alkyl, alkoxy, haloalkoxy and aryl.

29. The use according to Claim 28, of a compound of the formula (I) wherein W is $-N(R^{36})-$ where R^{36} forms a bond with R^{35}, or a pharmaceutically acceptable salt thereof for producing a therapeutic agent for osteoporosis.

30. The use according to Claim 28, of the compound of the formula (I) wherein W is $-N(R^{36})-$ where R^{36} forms a bond with R^{35} and X and Y combinedly form $=N-N=C(R^6)-$ where R^6 is as defined in Claim 28, or a pharmaceutically acceptable salt thereof for producing a therapeutic agent for osteoporosis.

31. The use according to Claim 28, of the compound of the formula (I) wherein W is $-N(R^{36})-$ where R^{36} forms a bond with R^{35} and X and Y combinedly form $=N-N=C(R^{6'})-$ where $R^{6'}$ is alkyl having 6 to 20 carbon atoms, or a pharmaceutically acceptable salt thereof for producing a therapeutic agent for osteoporosis.

32. The use according to Claim 28 or Claim 30, of a compound of the formula (I), wherein the ring Q is



wherein R^{17} and R^{18} are as defined in Claim 28, or a pharmaceutically acceptable salt thereof for producing a therapeutic agent for osteoporosis.

33. The use according to Claim 32, of a compound of the formula (I) wherein W is $-N(R^{36})-$ where R^{36} forms a bond with R^{35}, R is alkyl, aryl, heteroaryl, aralkyl, heteroarylalkyl or a group of the formula selected from the group consisting of:

$-(CH_2)bN(R^8)(R^9)$ (1)

$-(CH_2)bOR^{10}$ (2)

$$-(CH_2)bN(R^{10})\overset{\overset{Z}{\|}}{C}N(R^{11})(R^{12}) \qquad (3)$$

$-(CH_2)bN(R^{10})CORa^{11}$ (4)

$-(CH_2)bN(R^{10})SO_2R^{44}$ (5)

$-(CH_2)_bN(R^{10})COOR^{45}$ (6)

$$-(CH_2)_bOC(=Z)N(R^{11})(R^{12}) \quad (7)$$

$-(CH_2)_bOCOR^{46}$ (8)

$-(CH_2)_bCON(R^{47})(R^{48})$ (9)

$-(CH_2)_bOSO_2R^{44}$ (10)

$-(CH_2)_bCOR^{49}$ (11)

$-(CH_2)_bS(O)nR^{11}$ (12)

$-CON(R^{10})OR^{8}$ (13)

$$-CON(R^{10})N(R^{10})C(=Z)Ra^{11} \quad (14)$$

$-CON(R^{10})N(R^{10})SO_2Ra^{11}$ (15)

$$-N(R^{10})C(=Z)N(R^{10})CORa^{11} \quad (16)$$

$$-N(R^{10})C(=Z)N(R^{10})SO_2Ra^{11} \quad (17)$$

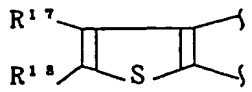
$-CON(R^{10})N(R^{10})(R^{11})$ (18)

$-(CH_2)_bN(R^{10})COCON(R^{11})(R^{12})$ (19)

and

$-(CH_2)_aCOOR^{1}$ (20)

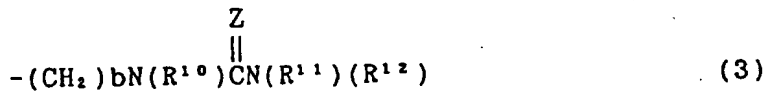
wherein each symbol is as defined in Claim 28 and the ring Q is a group of the formula



wherein each symbol is as defined in Claim 28, or a pharmaceutically acceptable salt thereof for producing a therapeutic agent for osteoporosis.

34. The use according to Claim 32, of a compound of the formula (I) wherein W is -N(R^{35})- wherein R^{35} forms a bond with R^{35}, R is alkyl, aryl, aralkyl or a group of the formula selected from the group consisting of:

$-(CH_2)bN(R^8)(R^9)$ (1)

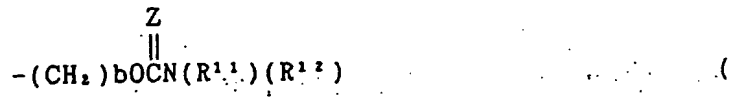


(3)

$-(CH_2)bN(R^{10})CORa^{11}$ (4)

$-(CH_2)bN(R^{10})SO_2R^{44}$ (5)

$-(CH_2)bN(R^{10})COOR^{45}$ (6)



(7)

$-(CH_2)bCON(R^{47})(R^{48})$ (9)

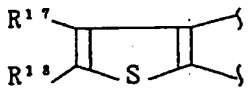
$-(CH_2)bOSO_2R^{44}$ (10)

$-(CH_2)bCOR^{49}$ (11)

and

$-(CH_2)aCOOR^1$ (20)

wherein each symbol is as defined in Claim 28 and the ring Q is a group of the formula



wherein each symbol is as defined in Claim 28, or a pharmaceutically acceptable salt thereof, for producing a therapeutic agent for osteoporosis.

35. The use according to Claim 28, of a compound of the formula (I) which is selected from the group consisting of:

9-tert-butyl-4-(2-chlorophenyl)-2-(2-(4-isobutylphenyl)ethyl)-6-methyl-6H-thieno[3,2-f][1,2,4]triazolo-[4,3-a][1,4]diazepine,

3-[4-(2-chlorophenyl)-6,9-dimethyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-2-yl]propionic morpholide,

4-(2-chlorophenyl)-6,9-dimethyl-2-(3-morpholinopropyl)-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepine,

4-(2-chlorophenyl)-2-(2-(4-isobutylphenyl)ethyl)-9-methyl-6-propyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepine,

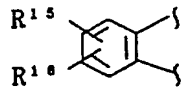
4-(2-chlorophenyl)-6-isobutyl-2-(2-(4-isobutylphenyl)ethyl)-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo-[4,3-a][1,4] diazepine,

4-(2-chlorophenyl)-2-(2-(4-isobutylphenyl)ethyl)-9-methyl-6-phenyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-

a][1,4]diazepine,
6-benzyl-4-(2-chlorophenyl)-2-(2-(4-isobutylphenyl)ethyl)-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepine,
N-(4-(2-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-2-indolecarboxamide,
N-(4-(2-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-3-indoleacetamide,
6-benzoylamino-4-(2-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepine,
4-(2-chlorophenyl)-2-ethyl-9-methyl-6-(3-(3-tolyl)ureido)-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepine,
8S-(+)-6-(2-chlorophenyl)-3-cyclopropanecarbonyl-8,11-dimethyl-2,3,4,5-tetrahydro-8H-pyrido-[4',3':4,5]thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepine,
6-(2-chlorophenyl)-8,9-dihydro-1,4-dimethyl-8-morpholinocarbonyl-4H,7H-cyclopenta[4,5]thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepine,
(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)acetic acid,
N-(2-methoxyphenyl)-(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepin-6-yl)acetamide,
N-phenyl-(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)acetamide,
N-(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-p-toluenesulfonamide,
(4-(4-methoxyphenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4][triazolo[4,3-a][1,4]diazepin-6-yl)-N-(3-methylphenyl)carbamate,
4-(2-chlorophenyl)-2-ethyl-9-methyl-6-phenylacetylamino-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepine,
N-(4-chlorophenyl)-N'-(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepin-6-yl)urea,
N-(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-methoxyphenyl)urea,
N-(4-(4-chlorophenyl)-2-hexyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-methylphenyl)urea,
N-(4-(2-chlorophenyl)-2,3,9-trimethyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-methylphenyl)urea,
N-(4-(2-chlorophenyl)-9-cyclohexyl-2-ethyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-methoxyphenyl)urea,
N-(2-ethyl-9-methyl-4-(4-methylphenyl)-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-methylphenyl)urea,
N-(4-(2-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-phenylurea,
N-(2-ethyl-9-methyl-4-phenyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-methylphenyl)urea,
N-(4-(4-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(2-methoxyphenyl)urea,
N-(4-(2-chlorophenyl)-2-ethyl-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-phenylthiourea,
N-(2-butyl-4-(4-chlorophenyl)-9-methyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(3-methylphenyl)urea,
N-(4-(2-chlorophenyl)-2-ethyl-9-cyclohexyl-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]diazepin-6-yl)-N'-(2-methylphenyl)urea,
4-(4-chlorophenyl)-2-ethyl-9-methyl-6-(3-phenylpropyl)-6H-thieno[3,2-f][1,2,4]triazolo[4,3-a][1,4]-diazepine,
2-ethyl-4-phenyl-9-undecyl-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c][1,4]oxazepine,
6-(2-chlorophenyl)-1-undecyl-7,8,9,10-hexahydro-4H,6H-triazolo[3,4-c][1]benzothieno[2,3-e][1,4]-oxazepine,
4-(2-chlorophenyl)-2-(2-(4-isobutylphenyl)ethyl)-9-methyl-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c]-[1,4]oxazepine,

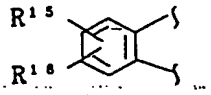
4-(4-chlorophenyl)-2-ethyl-9-(3-(4-isobutylphenyl)propyl)-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c]-[1,4]oxazepine,
2-ethyl-9-heptyl-4-(4-methoxyphenyl)-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c][1,4]oxazepine,
2-ethyl-4-(4-methylphenyl)-9-undecyl-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c][1,4]oxazepine,
2-ethyl-4-(4-hydroxyphenyl)-9-undecyl-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c][1,4]oxazepine and
2-ethyl-4-(4-(2-dimethylaminoethoxy)phenyl)-9-undecyl-4H,6H-thieno[2,3-e][1,2,4]triazolo[3,4-c][1,4]-oxazepine,
or a pharmaceutically acceptable salt thereof, for producing a therapeutic agent for osteoporosis.

36. The use according to Claim 28 or Claim 31, of a compound of the formula (I) wherein the ring Q is a group of the formula



wherein R^{15} and R^{16} are as defined in Claim 28, or a pharmaceutically acceptable salt thereof, for producing a therapeutic agent for osteoporosis.

37. The use according to Claim 36, of a compound of the formula (I) wherein the ring Q is a group of the formula



wherein R^{15} and R^{16} are as defined in Claim 28, W is $-N(R^{35})-$ where R^{35} is hydrogen or forms a bond with R^{35} or -O-, R is hydrogen, heteroarylalkyl or a group of the formula selected from the group consisting of:

$$-(CH_2)_bN(R^{10})\overset{\overset{Z}{\|}}{C}N(R^{11})(R^{12}) \qquad (3)$$

$-(CH_2)_bN(R^{10})SO_2R^{44}$ (5)

$-(CH_2)_bN(R^{10})COOR^{45}$ (6)

$$-(CH_2)_bO\overset{\overset{Z}{\|}}{C}N(R^{11})(R^{12}) \qquad (7)$$

$-(CH_2)_bOCOR^{46}$ (8)

$-(CH_2)_bCON(R^{47})(R^{48})$ (9)

$-(CH_2)_bOSO_2R^{44}$ (10)

$-CON(R^{10})OR^8$ (13)

$$-CON(R^{10})N(R^{10})\overset{\overset{Z}{\|}}{C}Ra^{11} \quad (14)$$

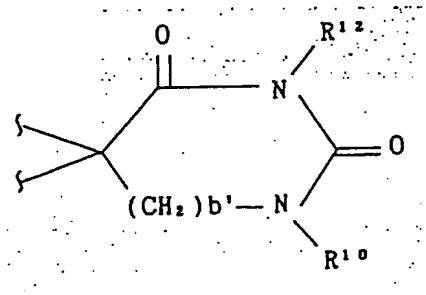
$$-N(R^{10})\overset{\overset{Z}{\|}}{C}N(R^{10})CORa^{11} \quad (16)$$

$$-N(R^{10})\overset{\overset{Z}{\|}}{C}N(R^{10})SO_2Ra^{11}. \quad (17)$$

and

$-CON(R^{10})N(R^{10})(R^{11})$ (18)

wherein each symbol is as defined in Claim 28, and R' is hydrogen or $-COOR^8$ wherein R^8 is as defined in Claim 28, or R and R' combinedly form a spiro ring of the formula



wherein each symbol is as defined in Claim 28, or a pharmaceutically acceptable salt thereof, for producing a therapeutic agent for osteoporosis.

38. The use according to Claim 28, of a compound of the formula (I) which is selected from the group consisting of:
6-(4-chlorophenyl)-1-undecyl-4H,6H-[1,2,4]triazolo[4,3-a][1,4]benzoxazepine,
8-decyl-1,4-dimethyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine.
9-decyl-1,4-dimethyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
6-(4-chlorophenyl)-1-undecyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
6-(4-chlorophenyl)-1-undecyl-4H,5H,6H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
6-(4-chlorophenyl)-1-(3-(isobutylphenyl)propyl)-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
N-benzoyl-N'-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(2-pyridyl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(3-pyridyl)urea,
N-(8-chloro-1-methyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(2-methoxyphenyl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(2-methoxyphenyl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(3-tolyl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-phenyl-oxalyldiamide,
N-(1-methyl-6-(2-thienyl)-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(3-tolyl)urea,
6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine-4-spiro-5'-(3'-(3-tolyl)-2',4'-dioxoimidazolidine),
N-(6-(4-chlorophenyl)-4-ethoxycarbonyl-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-

N'-(3-tolyl)urea,
(1-methyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl-p-toluenesulfonate.
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl-N'-(2-methoxyphenyl)urea.
N-[6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazol[4,3-a][1,4]benzodiazepin-4-yl)methyl]-N'-(3-tolyl)-urea,
N-(3-tolyl)-O-((1-methyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl)carbamate,
N-(2-methoxyphenyl)-O-((1-methyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl)-carbamate,
(1-methyl-6-phenyl-4H-[1,2,4]triazolo[4,3-a][1,4]benodiazepin-4-yl)methyl phenylacetate,
6-(4-chlorophenyl)-4-(3-indolylmethyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-O-benzyl carbamate,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)benzylsulfonamide,
(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazol[4,3-a][1,4]benzodiazepin-4-yl)carbohydrazide,
N'-p-tosyl-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-carbohydrazide,
O-benzyl-N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-carbohydroxamate,
N-benzyl-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine-1-yl)-carboxamide,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)methyl-2-indolecarboxamide,
N-benzyl-N'-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)urea,
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-N'-(cyclohexyl)urea.
N-(6-(4-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepin-4-yl)-2-indolecarboxamide,
8-chloro-6-(2-chlorophenyl)-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine,
8-chloro-6-phenyl-1-methyl-4H-[1,2,4]triazolo[4,3-a][1,4]benzodiazepine and
8-chloro-6-(2-chlorophenyl)-4H-imidazo[1,2-a][1,4]benzodiazepine,
or a pharmaceutically acceptable salt thereof for producing a therapeutic agent for osteoporosis.